Audi
Truth in Engineering

A3 TDI®
A6 TDI®
A7 TDI®
A8 L TDI®
Q5 TDI®
Q7 TDI®

FUEL FOR THOUGHT

# TDI® clean diesel

02 2015

# Understanding the upside of diesel can take a whole day.

Sometimes consumers understand the benefits of TDI® clean diesel immediately. Through their research, they've found that today's TDI® clean diesel engines all but sip the fuel and emit less $CO_2$ than their gasoline equivalents.[1] They may have heard that the throttle response in our diesel engines helps you feel every bit of the broad torque band of true Audi performance.[2] Other people might need a test-drive to confirm the facts, or need a whole brochure like this one. As for the skeptics, the ones who remember diesel engines from the sooty old days of charcoal-black smoke and stuttering spasms of acceleration, we want to give them a full day to help them see the upside of innovation. Take the 24 Hours of Le Mans. Not surprisingly, given their power and fuel efficiency, Audi racecars have regularly won this prestigious performance and endurance race, and the Audi R10 TDI® was the first diesel-powered vehicle to win, in 2006. Since then, TDI® diesel engines in our R15 and R18 racecars have continued to win motorsports' most grueling race, despite rules designed specifically to counteract their inherent advantages.

Audi R18 TDI®_

3.7-liter V6 TDI® engine_

Victory in the 24 Hours of Le Mans on June 11, 2011_

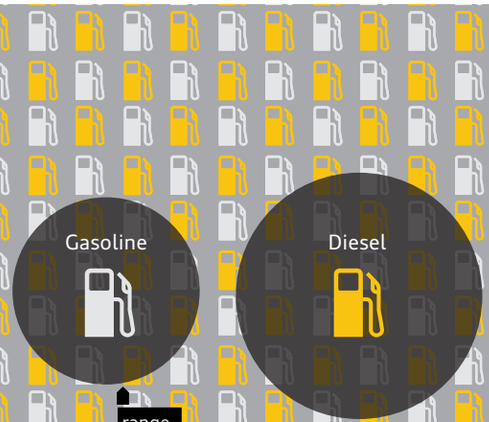
TDI® technology has won seven Le Mans titles since 2006.

1 See www.fueleconomy.gov for EPA estimates and emissions data. Your mileage and emissions will vary and depend on several factors, including your driving habits and vehicle condition. 2 Always obey all speed and traffic laws.

Photo by William Moore

# A subject that hits close to home.

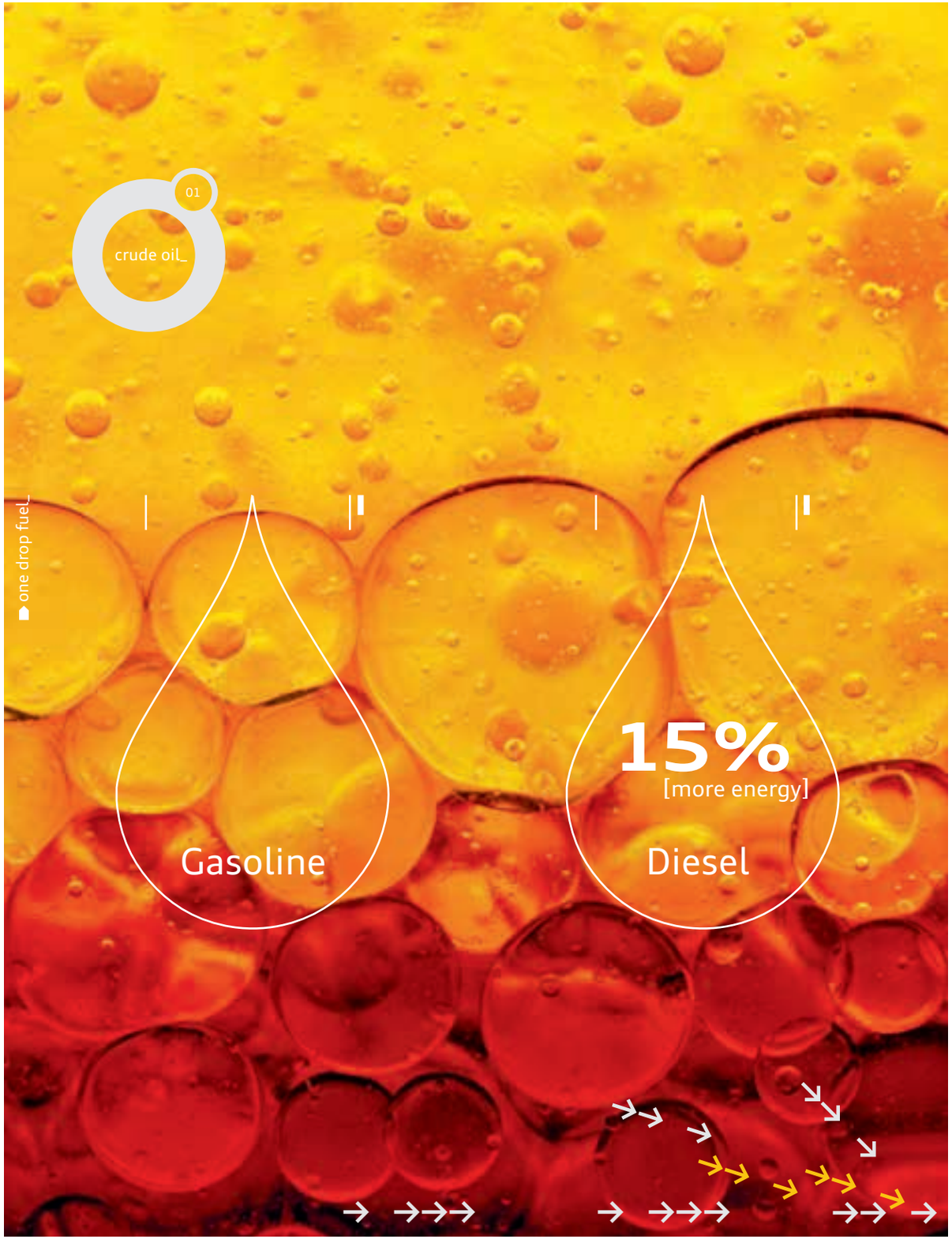
You know how it goes: you see something for the first time, then suddenly you begin to see it everywhere. Your mind has awakened to something new. Diesel fuel availability is something like that. To those who don't use diesel, it may seem somewhat invisible. They know it's there, but they're just not aware of how common it is. Yet, in fact, of the approximately 158,000 gas stations in the United States, more than half offer diesel[1]—with more adopting the fuel every day. You know it's available at most stations just off the interstate, but did you know that it can often be found at your local corner station as well? What's more, the increased range of your more efficient TDI® clean diesel Audi means that you can go farther between fill-ups.[2] Add to that Audi connect® diesel fuel locator capabilities, and finding diesel fuel is easier than ever.[3] Eye-opening, isn't it?




There are about 158,000 gas stations in the U.S. More than half of them offer diesel.[1]

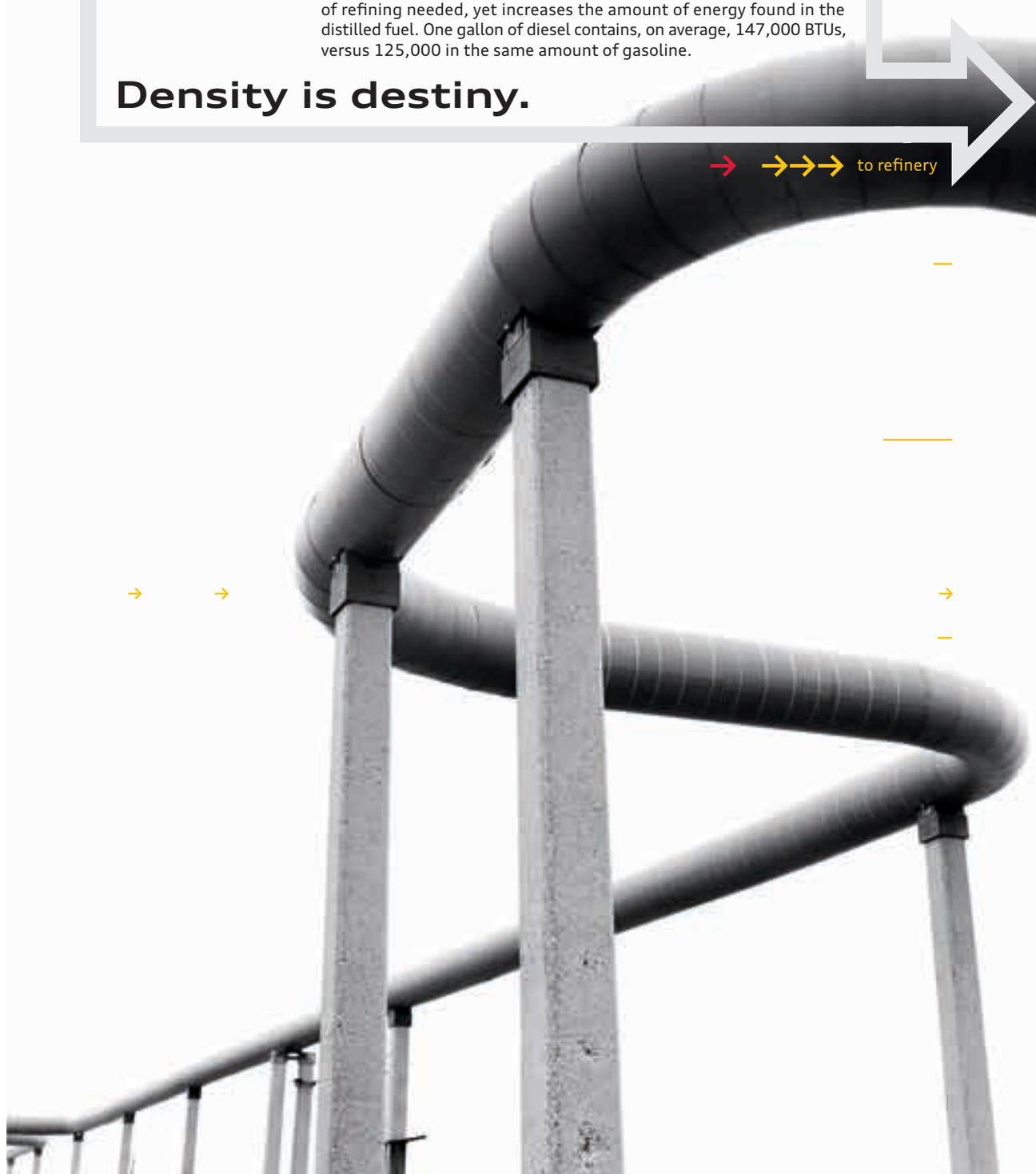
Because you have more range with a TDI® clean diesel engine, you'll have plenty of chances to refuel.[2]

1 Source: U.S. Bureau of Census (2010). 2 See www.fueleconomy.gov for EPA estimates and range details. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition. 3 Always pay careful attention to the road, and do not drive while distracted. The features and technologies discussed are optional, may require an additional subscription with separate terms and conditions, and should be used only when it is safe and appropriate. The Wi-Fi® hotspot feature is intended for passenger use only.




It might seem counterintuitive, given that a drop of diesel has more inherent energy than the same amount of gasoline, but both fuels start out as the exact same thing: crude oil. Different fuels are separated by their boiling points through distillation. Increasing the boiling point reduces the amount of refining needed, yet increases the amount of energy found in the distilled fuel. One gallon of diesel contains, on average, 147,000 BTUs, versus 125,000 in the same amount of gasoline.

## Density is destiny.



02 refinement process_

diesel molecule

ULSD

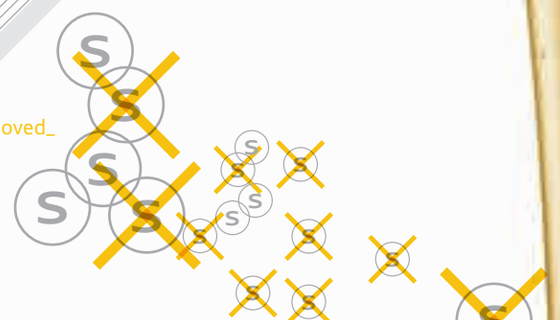
ultra-low-sulfur diesel_

Today's diesel contains 97% less sulfur than it did a decade ago.

03

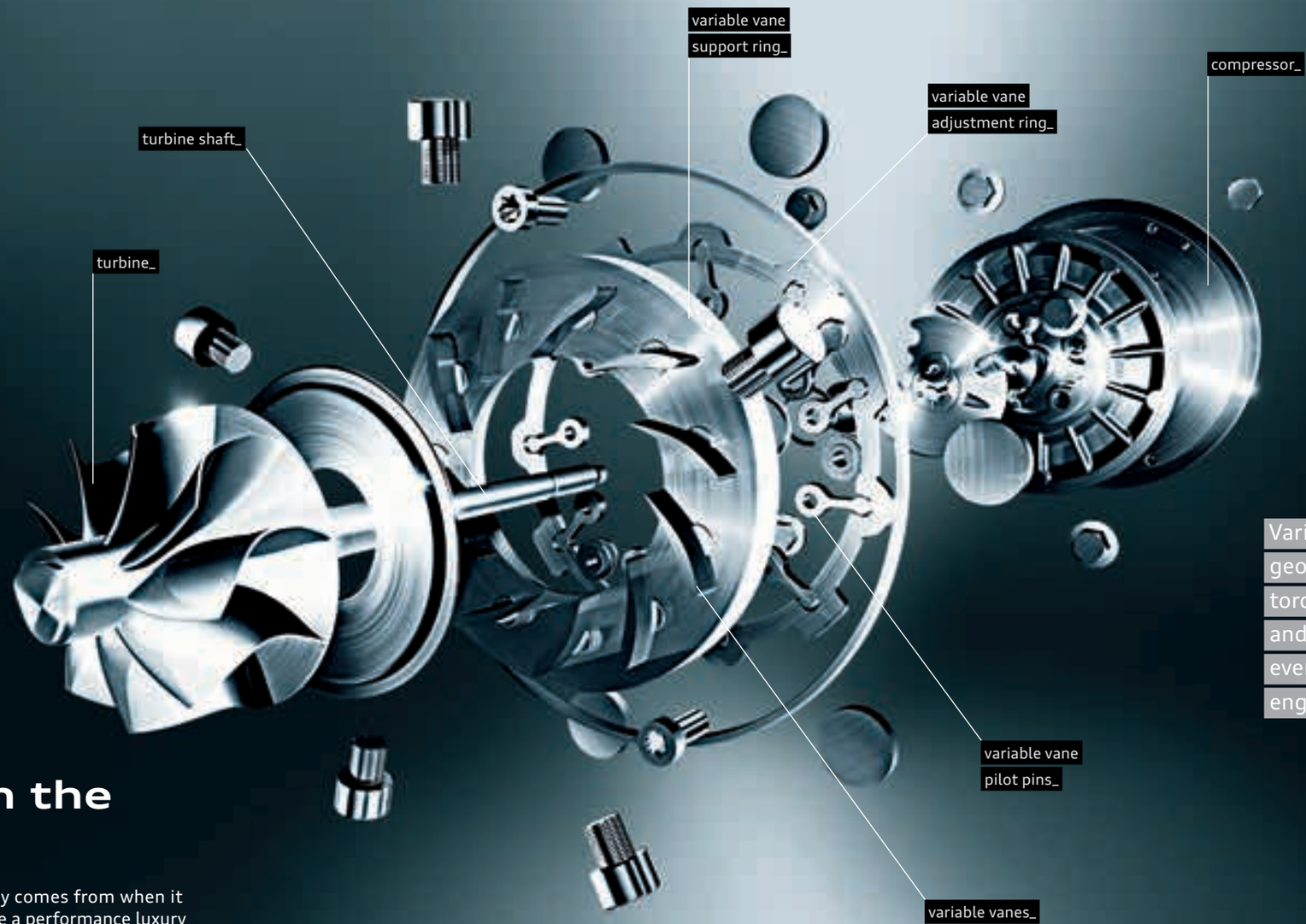
to vehicle

sulfur removed_



# How to make oil less crude.

Once properly distilled, the next step for diesel fuel is a little refinement. Think of it as a finishing school for a once-notorious malcontent. First, high-sulfur distillates, like diesel or jet fuel, are heated to temperatures that exceed 600°F. In the process, the sulfur leaves the hydrocarbon molecules and binds to the hydrogen, helping separate the pollutant from the fuel. Which is all a complicated way of saying it's necessary to properly clean the fuel, making the difference between the old-school version of diesel and the ultra-low-sulfur kind that is certified for use in all 50 states.




Variable turbine geometry builds up torque smoothly and without delay, even at very low engine speed.

# This is efficiency in the fast lane.

Of course it's important to know where the efficiency comes from when it comes to diesel, but, ultimately, you also want to drive a performance luxury vehicle. That means power and performance born of superior engineering. With the variable vane turbocharger in our TDI® clean diesel engine, you'll never forget you're in an Audi vehicle. From a performance standpoint, the variable vane turbocharger produces pressure not only at the top end of the speed range, but also across the full spectrum of the performance range, giving you elasticity—so not only do you feel the punch of torque, your passing speed between, say, 50 and 65 mph is also impressive.[1] But, ingeniously, the engine design with its low rpm operating range also serves to help reduce fuel consumption at higher speeds, while adding a bit more acceleration with high torque at the lower end.[2]

1 Always obey all speed and traffic laws. 2 See www.fueleconomy.gov for EPA estimates. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition.

# A very small expression of power.

Sometimes power screams, asserting itself in giant numbers or a roaring engine. But discerning drivers know that power and torque at their best can be felt subtly too, in the precision of acceleration, in the balance, and in the perfect mechanical response to your desires. We like to think that you feel it every time you step into an Audi, of course, but more than that, we are confident of your response because we know the craft we put behind the delivery of power. And far from being a grand statement of horsepower, it may be best articulated by the tiny, precisely delivered droplets of diesel fuel injected directly into the combustion chambers at exactly the right time by piezo fuel injectors. A small thing, perhaps, but one that works to help enhance efficiency and reduce emissions through as many as five partial fuel injections in a single combustion cycle.[1]

Piezo injector nozzle_

05
injection_

The piezo injectors help lower the combustion noise normally associated with diesel engines, while optimizing the distribution and timing of fuel injected in the combustion chamber, helping to reduce exhaust emissions further.

1 See www.fueleconomy.gov for EPA estimates and emissions data. Your mileage and emissions will vary and depend on several factors, including your driving habits and vehicle condition.

06

com-
bustion_

# Under Pressure

## When compressed thinking turns into a big idea.

The fuel itself was named after a German engineer, but he didn't invent the fuel, he invented the engine that used it. It differs from the traditional gasoline engine in many ways, but the major difference, other than the fuel used, was the way a gas engine would mix air and fuel. With gas, the mixture would ignite with the help of a spark plug ignition system, while a diesel engine compresses air first at higher pressures, then injects the fuel. The hot, compressed air ignites the fuel without the need of an ancillary ignition system, to move the pistons. To the engineer, this high compression would lead to improved efficiency and power.[1] And he was right. The average gas engine compresses at a ratio between 8:1 and 12:1, while diesel engines compress anywhere between 14:1 and 16.8:1, which shows how some things work better under increased pressure.

1 See www.fueleconomy.gov for EPA estimates. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition.

# Thankfully, there is always a catch.

Clean diesel, the kind that powers TDI® clean diesel technology, is demonstrably cleaner than the fuel used in previous generations of diesel engines. Innovations have removed much of the pollutants, resulting in 12% lower $CO_2$ emissions on average than the output from comparable gasoline engines[1]—while still delivering greater fuel efficiency.[2] So what's the catch? We have a few that further clean the diesel exhaust. The names might sound daunting—close-coupled oxidation catalysts, coated particle filters, active exhaust gas after-treatment systems utilizing AdBlue® reducing agent, but the thing they do is simple. Audi employs these systems via sensors which help detect the soot level and emissions of the exhaust to work at maximum efficiency, filtering excess pollutants and particles, which allows you, and everyone else, to breathe easier about clean diesel.

Electron microscope image of soot particles_

IN

OUT

Diesel particulate filters reduce up to 95% in diesel particle emissions.

**1 µm** (0.001 mm)

SCALE REFERENCE

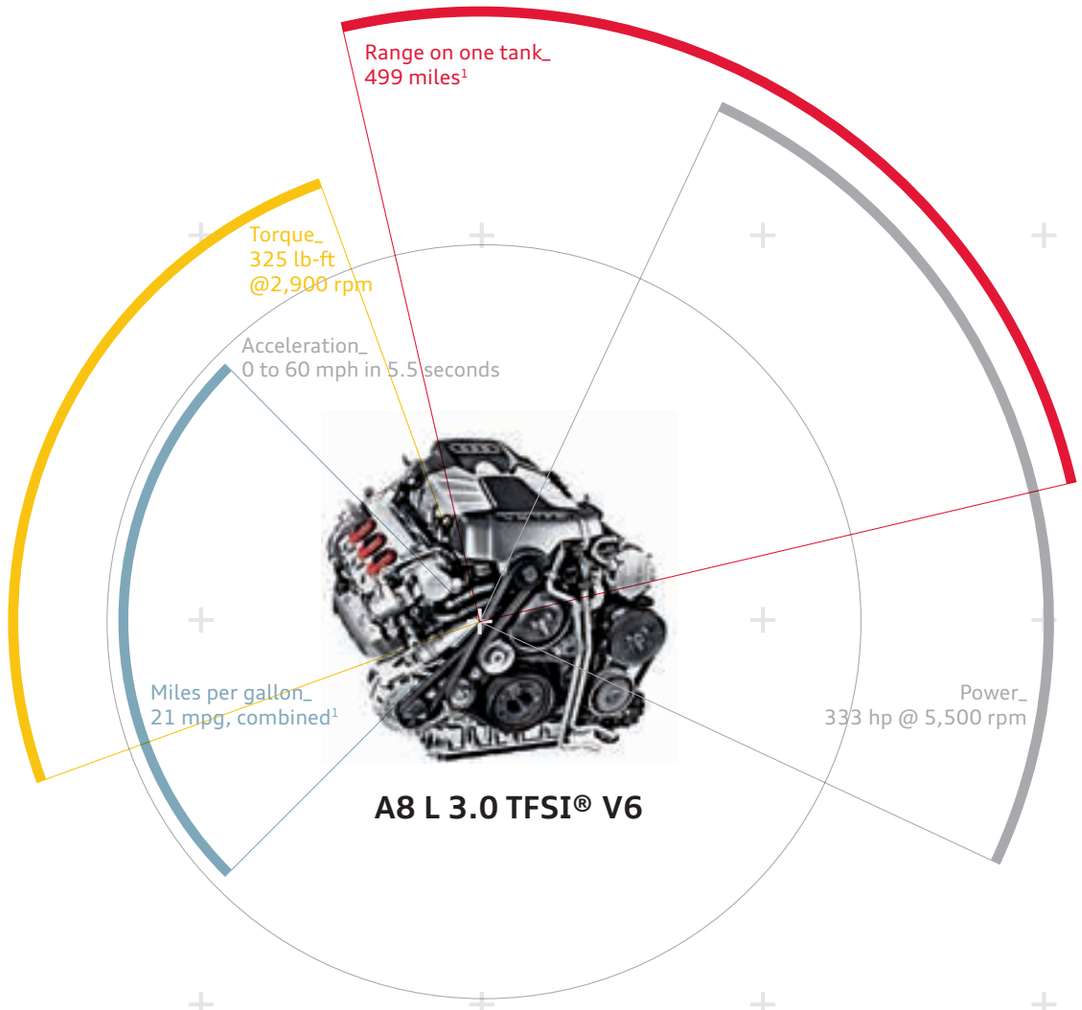
**Diesel particulate filter**

During normal driving conditions, the exhaust gas passes through the particulate filter. The filter then channels it through porous walls, catching larger particles to help clean the exhaust. During low engine load situations such as city traffic, exhaust gas temperature lacks the heat needed for oxidization, so fuel injection helps raise the temperature to between 1,150°F and 1,200°F to help oxidize the carbon soot before it reaches the particulate filter, further helping to reduce emissions.

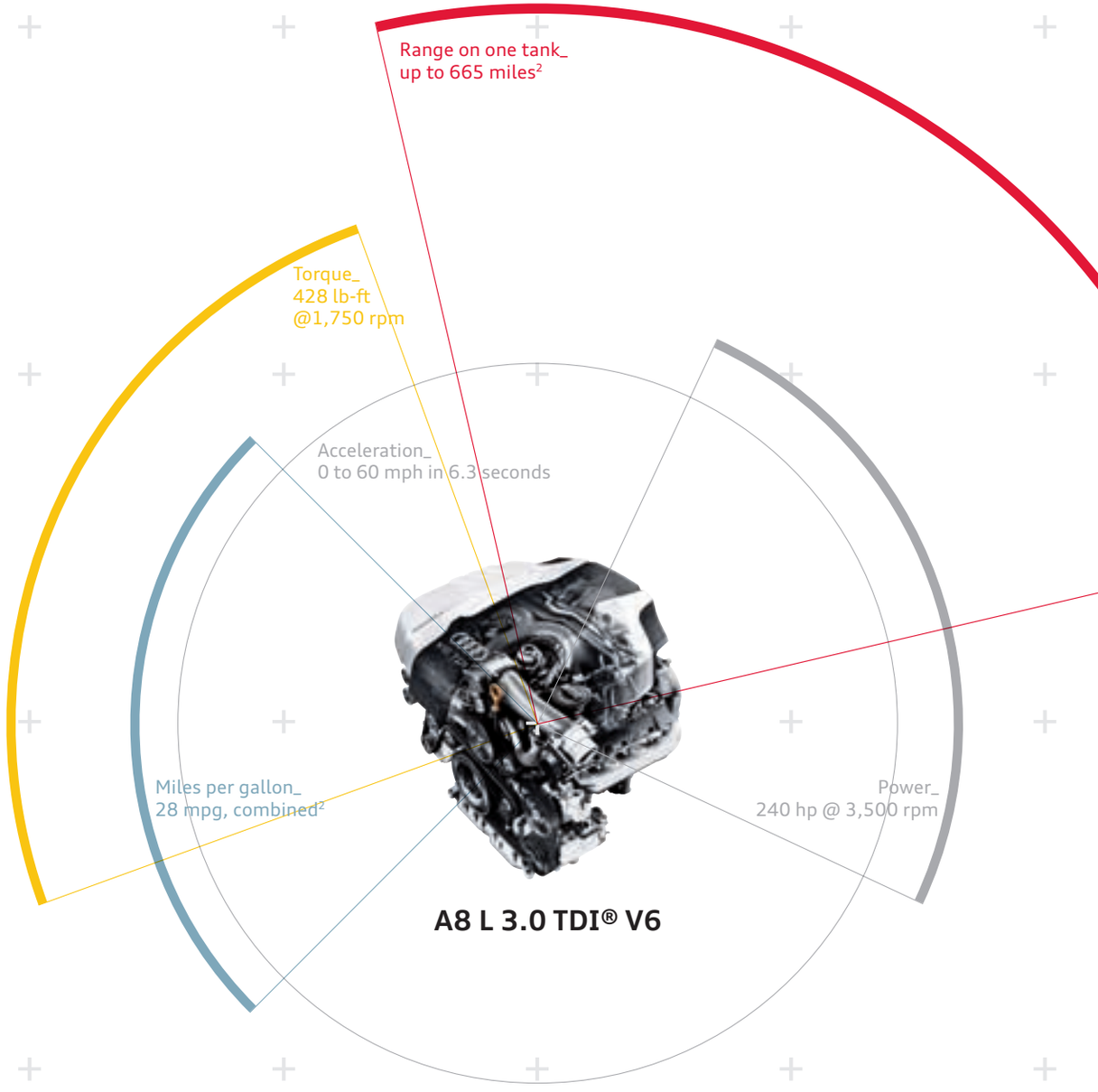
**AdBlue® system**

Featuring a reducing agent that is a pure, transparent solution of 32.5% urea and water, AdBlue® is a diesel exhaust after-treatment that further purifies the exhaust by helping turn $NO_x$ emissions into nitrogen and oxygen. AdBlue® is a nontoxic, noncombustible, biodegradable innovation that has helped make the use of diesel fuel in passenger cars acceptable in all 50 states, and has helped make diesel even cleaner.

1 Based on the average emissions data for each TDI® model versus its comparable gasoline option as follows: A8 L—14.3%; A7—17%; A6—15.3%; Q5—10.3%; Q7—6.9% (average for all—12.76%). Based on EPA data. See www.fueleconomy.gov for details. Your vehicle emissions will vary and depend on several factors, including your driving habits and vehicle condition. 2 See www.fueleconomy.gov for EPA estimates. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition.




**A8 L 3.0 TFSI® V6**

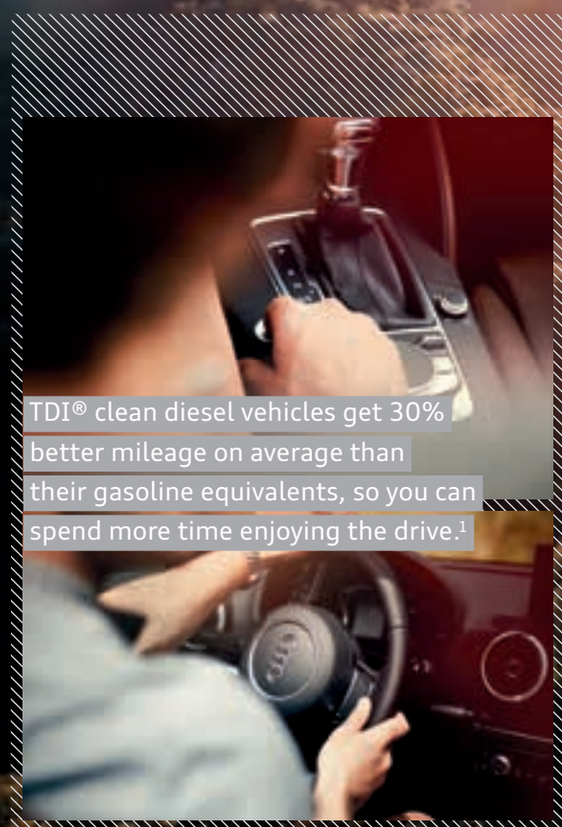



**A8 L 3.0 TDI® V6**

## It might be time to expand your horizons.

Just by looking at TDI® clean diesel, you've already broadened your horizons. Once you get behind the wheel of, say, an Audi A8 L TDI®, you might have to broaden them even further. Maybe even set a destination far beyond them. In other words, TDI® clean diesel might just be your best companion on a road trip. It'll go farther than you might even want to go. Enjoy your time between refills, great mileage and more-than-ample power. TDI® clean diesel can make any interstate your home, put almost any horizon within reach, and extend your range significantly. It's just more fuel for thought.

All mpg based on 2014 EPA estimates. 2015 EPA estimates not available at time of publication. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition. 1 18 city/28 highway/21 combined mpg (2014 Audi A8 L 3.0T with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive). Range based on 21 mpg combined and a 23.8-gallon gas tank. 2 24 city/36 highway/28 combined mpg (2014 Audi A8 L TDI® clean diesel with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive). Range based on 28 mpg combined and a 23.8-gallon gas tank.



TDI® clean diesel vehicles get 30% better mileage on average than their gasoline equivalents, so you can spend more time enjoying the drive.[1]

A6 TDI® + A7 TDI® + Q7 TDI®
**700+**
[highway miles][2,3,4]

A8 L TDI®
**800+**
[highway miles][5]

# There's an optimistic air about clean diesel.

TDI® clean diesel engines emit 12% lower $CO_2$ emissions on average than their comparable gasoline engines.[6] They have a longer range and get better mileage than traditional gasoline models. They embody engineering innovation. We're confident that you get the gist of what TDI® clean diesel delivers, its future, and its present as a powerful, iconic and efficient alternative to gasoline, hybrid or all-electric vehicles. But Audi wants you to never forget the real luxuries of ownership. There are no compromises. This is, after all, Audi. That means you don't get just precision handling, you get the performance and grip of available quattro® all-wheel drive. You don't just get great mileage, you get the added efficiency of ultra® lightweight technologies. This is where you feel the need to get in one, celebrate the possibilities of clean diesel performance by putting the windows down and discover just how bright the future can be.

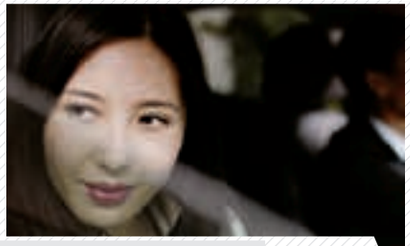
Q5 TDI®
**600+**
[highway miles][7]

All mpg based on 2014 EPA estimates. 2015 EPA estimates not available at time of publication. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition. 1 30% better mileage over gasoline engines is based on 2014 A6, A7, A8 L, Q5 and Q7 TDI® models' average combined mpg as rated by the EPA vs. their 2014 EPA-rated gasoline-powered equivalents. 2 2014 A6 3.0-liter TDI® clean diesel V6 with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive: 24 city/38 highway mpg. EPA estimates. Range based on EPA estimates of 38 highway mpg and a 19.2-gallon fuel tank. 3 2014 A7 3.0-liter TDI® clean diesel V6 with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive: 24 city/38 highway mpg. Range based on EPA estimates of 38 highway mpg and a 19.2-gallon fuel tank. 4 2014 Q7 3.0-liter TDI® clean diesel V6 with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive: 19 city/28 highway mpg. Range based on 28 highway mpg and a 26.4-gallon fuel tank. 5 2014 A8 L 3.0-liter TDI® clean diesel V6 with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive: 24 city/36 highway mpg. EPA estimates. Range based on EPA estimates of 36 highway mpg and a 23.8-gallon fuel tank. 6 Based on the average emissions data for each TDI® model versus its comparable gasoline option as follows: A8 L—14.3%; A7—17%; A6—15.3%; Q5—10.3%; Q7—6.9% (average for all—12.76%). Based on EPA data. See www.fueleconomy.gov for details. Your vehicle emissions will vary and depend on several factors, including your driving habits and vehicle condition. 7 2014 Q5 3.0-liter TDI® clean diesel V6 with eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive: 24 city/31 highway mpg. Range based on 31 highway mpg and a 19.8-gallon fuel tank.

# When it comes to luxury, we'd change only one thing.

It's true. The interior of a TDI® clean diesel Audi isn't exactly the same as its gasoline equivalent. They have slightly different tachometers to gauge diesel's peak power at lower revs. But if you can live with that difference, you'll find that an Audi interior is an Audi interior. That means unmatched fit and finish. A total commitment to craftsmanship and quality that you can feel in each stitch in the supple leather and every polished inch of your inlays. That means rich wood options. Or choosing a glistening aluminum trim. It means you will want to explore every inch of the seat with your hands and will hate to let go of the steering wheel when it's time to leave. It means compromising on taste or style exactly as much as you would on performance—which is to say, not at all.

# More fuel for thought about diesel.

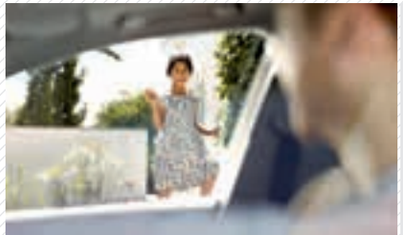


## I want a return on my investment_

TDI® clean diesel models typically have a higher resale value versus comparable gasoline vehicles.[1]

## I want to enjoy my drive_

Audi noise dampening innovations and innovative engineering have helped reduce traditional diesel engine noise.



## I want more time with my family_

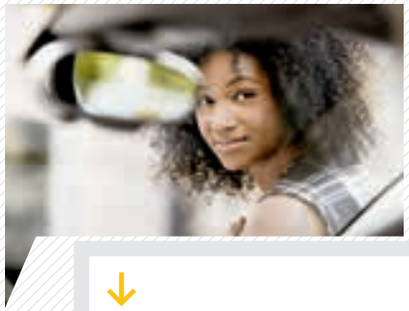
With diesel, you will make up to 30% fewer visits to the pump.[2]

1. Resale values will vary and is based on several factors, including mileage, vehicle condition and the local market. 2. 2015 EPA estimates not available at time of publication. 30% better mileage over gasoline engines is based on 2014 A6, A7, A8 L, Q5 and Q7 TDI® models' average combined mpg as rated by the EPA vs. their 2014 EPA-rated gasoline-powered equivalents. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition. 3. Based on the average emissions data for each TDI® model versus its comparable gasoline option as follows: A8 L–14.3%; A7–17%; A6–15.3%; Q5–10.3%; Q7–6.9% (average for all–12.76%). Based on EPA data. See www.fueleconomy.gov for details. Your vehicle emissions will vary and depend on several factors, including your driving habits and vehicle condition. 4. SOURCE: U.S. Environmental Protection Agency.

We've been working on diesel for 40 years now. In fact, half of all the vehicles Audi sells worldwide are diesels, so it's second nature to us. Still, we know that America is only now coming around to the benefits of TDI® clean diesel, and we're overcoming the misperceptions. But just in case there is more work to be done, we'd like to add some fuel for thought. First, you'll never have to worry about replacing a spark plug again—but there are plenty more dramatic benefits to owning a TDI® clean diesel. Yes, our TDI® clean diesel vehicles can be purchased in all 50 states. No, there is no particular problem starting them in traditional winter conditions. Yes, we know, there's always more to say about it. But we'd like you to try one for yourself and let us know if you have any other questions.

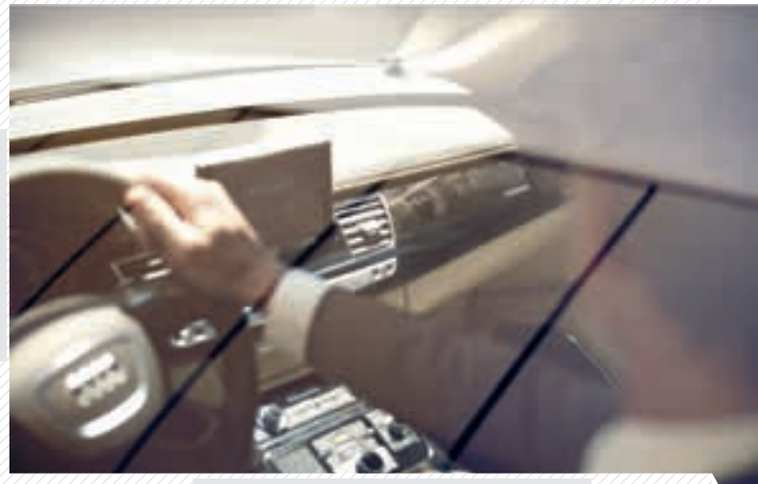
## I want an all-weather vehicle_

With the advances in fuel and fuel delivery, the old days of poor cold start-ups are long gone.



## I care for the environment_

TDI® clean diesel engines emit 12% fewer $CO_2$ emissions on average than their gasoline equivalents.[3]



## I want to help the U.S. conserve energy resources_

If 1/3 of us drove a TDI® vehicle, we'd save more than a million barrels of oil a day.[4]

# An uncompromised diesel.

Now that you know what we stand for, it's time to get into the results of our passion for automotive excellence. The all-new Audi A3 TDI® Sedan is mechanical proof that the amount of sheet metal has no bearing on level of luxury. It features advanced technology that much larger premium vehicles can only dream about while providing all the hallmark performance and craftsmanship Audi is known for. It is a diesel without compromise, exactly the kind you should expect from Audi TDI® clean diesel.

**A3** TDI®

| ENGINE | DRIVETRAIN |
| --- | --- |
| 2.0-liter TDI® clean diesel engine with 150 hp and 236 lb-ft of torque with AdBlue® exhaust after-treatment | Six-speed S tronic® dual-clutch transmission and front-wheel drive |

**A6** TDI®

| ENGINE | DRIVETRAIN | FUEL ECONOMY |
|---|---|---|
| 3.0-liter TDI® clean diesel V6 with 240 hp and 428 lb-ft of torque with AdBlue® exhaust after-treatment | Eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive | 24 city/38 highway/ 29 combined[2] |

**A7** TDI®

| ENGINE | DRIVETRAIN | FUEL ECONOMY |
|---|---|---|
| 3.0-liter TDI® clean diesel V6 with 240 hp and 428 lb-ft of torque with AdBlue® exhaust after-treatment | Eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive | 24 city/38 highway/ 29 combined[2] |

# TDI® clean diesel sedans

So seductive and stylish, the word “sedan” seems a bit small. Instead, the Audi A6, A7 and A8 L TDI® clean diesel Sedans should be described in somewhat bolder terms: spectacular, perhaps? Stately? Stunning? To a vehicle, they share the Audi DNA throughout. This is an A6, just as you know it, loaded with technology, effortlessly powerful and endlessly nimble. The A7 is every bit the iconic style leader, cornering with confidence and effortless precision. With refreshed styling and more engine torque (from 406 to 428 lb ft), the A8 L, of course, is still the executive’s choice, it’s a driver’s luxury car, the pinnacle of the automaker’s craft, a statement of cultivated tastes and well-defined performance—as well as a vehicle that provides better mileage than hybrids in the same segment.[1] These aren’t simply sedans, they are ultraefficient luxury diesel sedans, proudly wearing the four rings and TDI® clean diesel designation. Collectively, they are a signature achievement.

**A8 L** TDI®

| ENGINE | DRIVETRAIN | FUEL ECONOMY |
|---|---|---|
| 3.0-liter TDI® clean diesel V6 with 240 hp and 428 lb-ft of torque with AdBlue® exhaust after-treatment | Eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive | 24 city/36 highway/ 28 combined[2] |

1 2015 EPA estimates not available at time of publication. Based on EPA estimates for 2014 BMW ActiveHybrid 7 (22 city/30 hwy mpg), and the 2014 Lexus LS 600h L (19 city/23 hwy mpg) vs. the 2014 Audi A8 L TDI® clean diesel (24 city/36 hwy mpg). Your mileage will vary and depends on several factors, including your driving habits and vehicle condition. 2 2014 EPA estimates. 2015 EPA estimates not available at time of publication. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition.

# TDI® clean diesel SUVs

Efficiency is expected to carry more with the Audi Q5 and Q7 TDI® clean diesel models. In fact, they carry even more than families or camping gear, they carry the future. It's a versatile one, one that combines powerful torque with traditional SUV convenience, but never one that forgets its luxury lineage. Their diesel engines provide the torque which helps deliver powerful towing performance. They teem with thoughtful touches and innovations. Standard leather seating surfaces, available Audi connect®,[1] rich decorative wood inlays and available Audi accessories can bring out even more in your drive. From the five-passenger Q5 to the three-row, seven-passenger Q7, these incredibly efficient SUVs elevate luxury diesel and make it something iconic—and more.

**Q5** TDI®

| ENGINE | DRIVETRAIN | FUEL ECONOMY |
|---|---|---|
| 3.0-liter TDI® clean diesel V6 with 240 hp and 428 lb-ft of torque with AdBlue® exhaust after-treatment | Eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive | 24 city/31 highway/ 27 combined[2] |

**Q7** TDI®

| ENGINE | DRIVETRAIN | FUEL ECONOMY |
|---|---|---|
| 3.0-liter TDI® clean diesel V6 with 240 hp and 406 lb-ft of torque with AdBlue® exhaust after-treatment | Eight-speed Tiptronic® automatic transmission and quattro® all-wheel drive | 19 city/28 highway/ 22 combined[2] |

1 Always pay careful attention to the road, and do not drive while distracted. The features and technologies discussed above are optional, may require an additional subscription with separate terms and conditions, and should be used only when it is safe and appropriate. The Wi-Fi® hotspot feature is intended for passenger use only. 2 2014 EPA estimates. 2015 EPA estimates not available at time of publication. Your mileage will vary and depends on several factors, including your driving habits and vehicle condition.

**2015 | TDI**

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